Dynamic Test Systems

50 - 80 kN water cooled

RMS

Electrodynamic Vibration Test Systems

SW3-5445APP (50KN)
SW3-6445APP (60KN)
SW3-7445APP (70KN)
SW9110-80 (80KN)

Technical subject to changes without prior notice !

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The vibrators SW3-5445APP(50 KN) up to SW9110-80 (80KN)

Field of Applications
The 50-80KN water cooled high force shaker series is designed to test high weight specimens. The Long Stroke Shaker types “LS3” provide strokes up to 3” peak to peak. They are equipped with a robust armature structure. They are suitable for resonance determination, premature aging and fatigue testing of complete assemblies.
The shaker series allows to operates in a useful frequency range of 5 to 2700 Hz in sine, random and shock mode. The shaker series provide different armature diameters appropriate to the specimen size. Several features make these shaker series reliable for your applications.

Water cooled design
The shaker is water cooled by a separate cooling unit. These systems dissipate the heat generated more efficiently and work more quietly than air cooled systems.

High Overturning Moment
The armature design incorporates the robust top guidance and a linear bottom guidance. The system is capable to provide high overturning moments for testing products with a high centre of gravity.

Automatic Payload Support
A superior automatic pneumatic load support system guarantees a full nominal displacement with a maximum vertical load for test specimen and fixtures.

Standard Vertical and Horizontal Operation
The 50-80KN water cooled high force shaker series are air suspended in a rigid swivel frame in order to operate in vertical and horizontal configuration. The shaker can easily be moved in either vertical or a horizontal direction and can be used in combination with a slip table or environmental chamber with optional thermal barrier.

High Protection Standard
A high standard protection system of interlock circuits ensures the best level of protection for the operator, test specimens and the systems themselves.

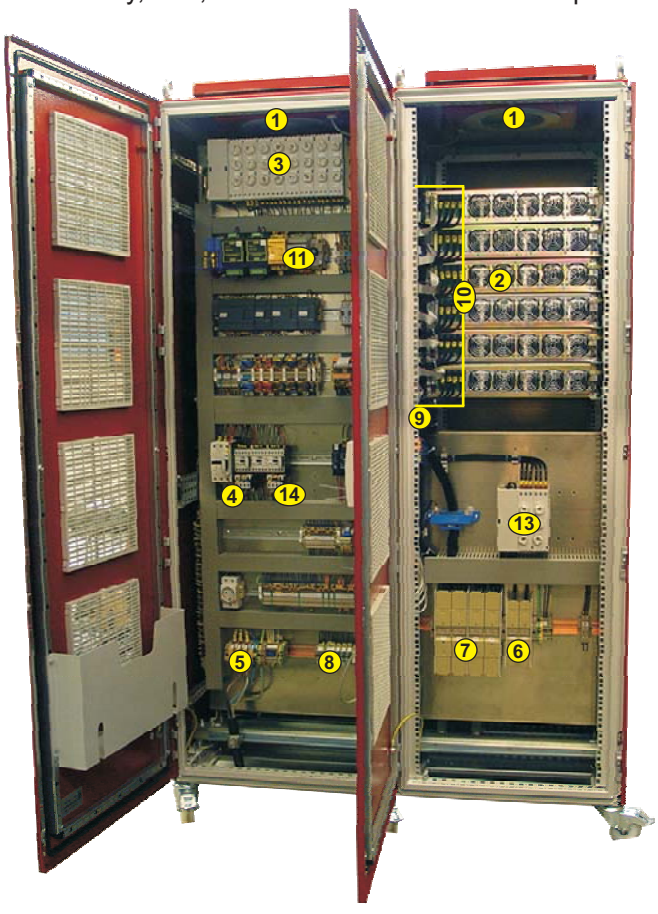
Controller
All RMS Shaker Systems can be operated with the RMS controller “Test Manager SWR1200/SWR1220” and with all third party Control Systems.

Power Amplifier
The systems are driven with a RMS power amplifier TGE series which is build as a 19” width and 2000 mm standard height cabinet .

- Air cooled design in accordance to European Type of Protection IP 53.
- **3** up to 160KVA output power in steps of 10KVA power modules
- **3**KVA power modules for low power shaker systems
- **U**sing latest MOSFET technology
- **H**igh efficiency
- **H**igh protection standards with a full range of system interlock circuits ensures high reliability
- **100%** compliance with international safety and EMC standards
- **110 kHz** switching frequency allow high signal bandwidth
- **Low** harmonic distortion
- **Compact** stand alone-design including field/degaussing field supply and EMI filter with free space for vibration controller or customer instrumentation.
- **PLC** controlled using touch screen user interface
- **Remote** controllable
- **Very high** peak performance for shock and random tests

All RMS shaker systems comply with the German, and international safety, EMI, EMC standards and the European Community directives:

- EU- Directive „Safety of machinery" 98/37/EWG
- DIN EN ISO 12100-1 and -2 , Safety of machinery Basis
- DIN EN 1050 Safety of machinery Principles for risk assessment
- DIN EN 60204-1, Safety of machinery Electrical equipment of machines
- DIN EN 50178, Electronic equipment for use in power installations
- DIN EN 61000-6-2 and -4, Electromagnetic compatibility (EMC)



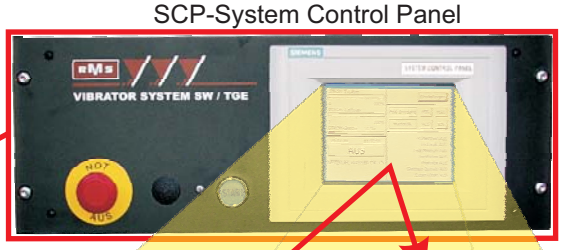
Legende

1	Blower
2	Powermodule
3	Lead fuses
4	Motor protection relay of the cooling blower
5	Mains connection
6	Connetion field coil
7	Connection Shaker A-B
8	Connection cooling blower
9	Reset button
10	Modul monitor
11	Fuses
12	Connection strip X2
13	**I**ntermediate circuit fuses
14	Motor protection relay of the hydraulic system

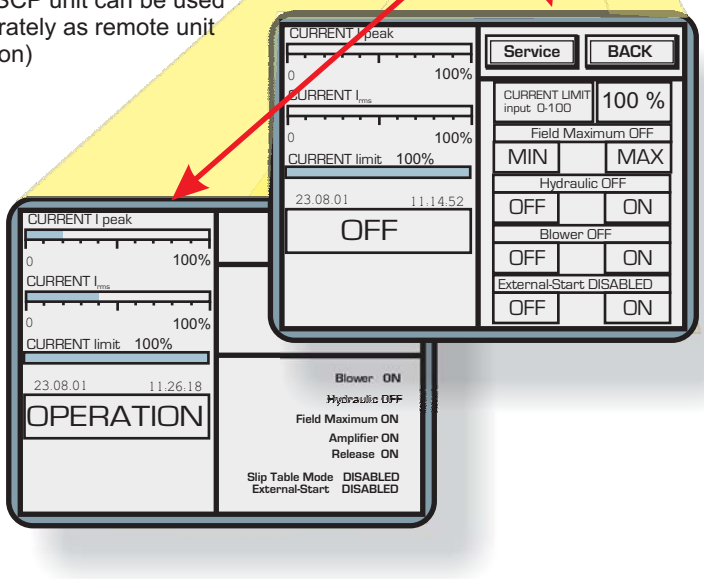
The operation of RMS-Electrodynamic Test Systems

Typical 19-inch rack configuration with:
- Power module TGE 10-4
- SCP System Control Panel
- Degaussing field supply

SCP-System Control Panel

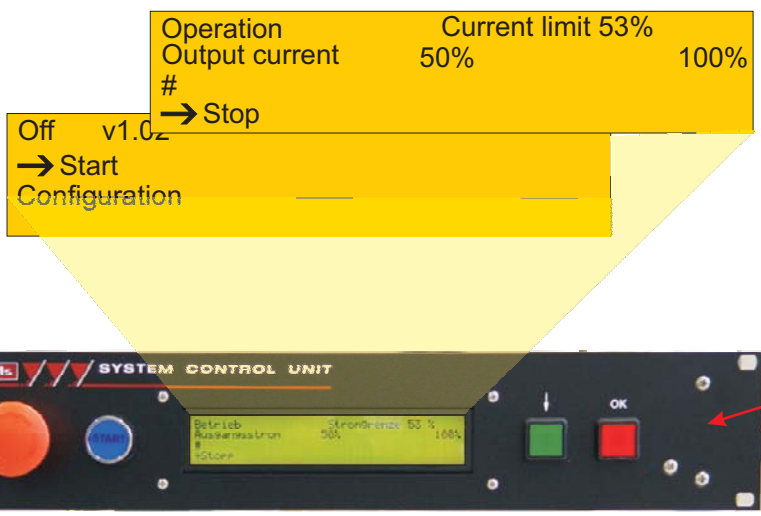


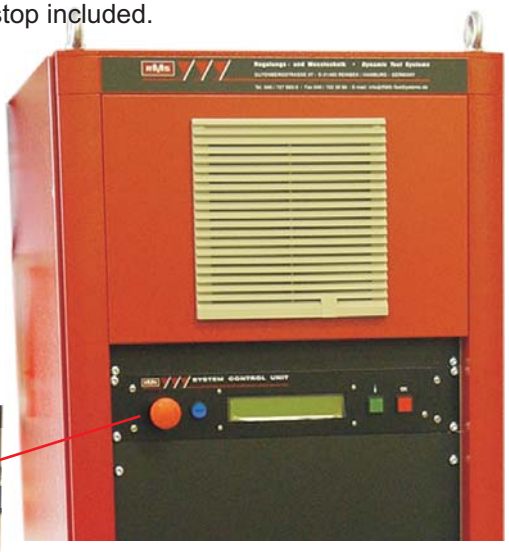
The SCP unit can be used separately as remote unit (Option)



SCP - System Control Panel
- comfort configuration (optional) -
recommended for larger system configurations with slip table.
The SCP - System Control Panel - provides instant access to all essential system information via touch screen input and LCD display. Panel can be used remotly.

SCU System Control Unit - Standard equipment for amplifiers TGE 10-X -
Microprocessor based amplifier / system control unit with LCD function display (monochrome) provides instant access to essential information of the system as amplifier status, setting including interlocks and output current information. Remote function for amplifier start / stop included.





RMS Dynamic Test Systems

Digital Controller "Test Manager SWR 1200 and SWR 1220"

Field of application:

The SWR 1200 Test Manager is an intelligent controller for the activation of electrodynamic and servo hydraulic vibrator systems.
With its modern microprocessor technology and ergonomically designed software architecture it is the first choice of testing and R&D departments. It is a useful tool in enforcing the application of many international test specifications (e.g. DIN EN 600 68-2, VDE, MIL, etc.)

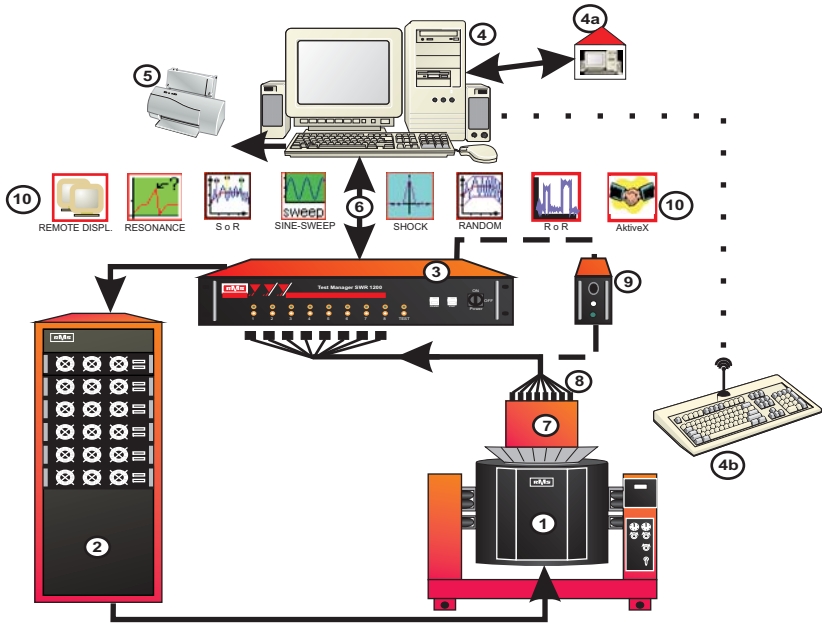
Characteristics:
The self-explanatory user interface (based on MS Windows) together with the modular upgrading concept are the main focuses of the SWR 1200. The Test Manager is networked (TCP/IP) and has comprehensive analysis functions.

Options:

The SWR 1200 Test Manager is available with the following options:

- Basic software: sine, random, shock
- Sine on random
- Resonance mode
- Road simulation
- ActiveX interface
- Test sequencing
- Remote display software
- 4 or 8 channel
- and more.....

Blockdiagram of a vibration system with controller

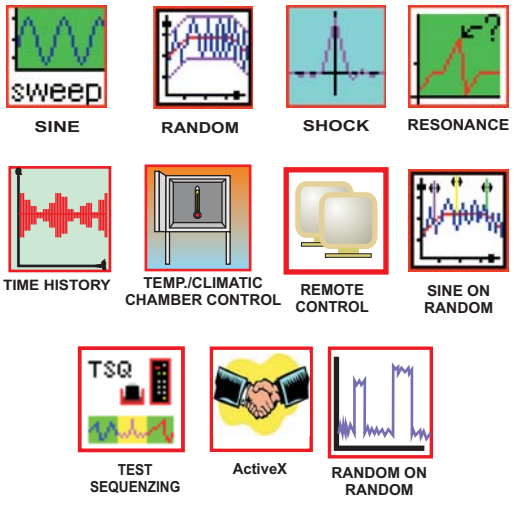


1. Vibration Generator
2. Power amplifier with or without Field Power Supply
3. Test Manager Controller SWR
4. Host-PC

4a. Host-PC 2 **4b:** Remote control unit

5. Printer
6. Network
7. Equipment under test (EUT), acceleration sensors connected (ICP-type)
8. Accelerometer
9. Charge amplifier - necessary when piezoelectric accelerometers used.
10. Software

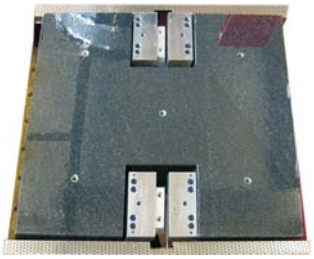
Software applications



RMS Dynamische Prüfsysteme

Horizontal slip tables

Field of application:
Horizontal slip tables extend the applications of vibration systems. A slip table is required in 3-axis tests where the operating position of the specimen is specified. The vertical axis (z) is tested on the shaker and the horizontal axes (x + y) on the slip table. The shaker can be pivoted within its frame for this purpose.
A slip table enables a test of very heavy or bulky specimen in a horizontal position. This combination is the perfect completion for specimens which have to be tested in their original fitting position.



Slip table base with V-bearings

Characteristics:
Vibrator and slip table are mounted on a common base element which is installed on air isolators to eliminate vibration transmission into the ground.
The slip plate with mounting inserts slides on an oil film provided by a hydraulic unit. Our horizontal slip tables consist of the slip table plate, linear bearings guidance, the coupling between shaker and plate and finally the main frame with integrated swivel frame and hydraulic supply.
The slip tables are suitable for combination with a temperature or climatic chamber.

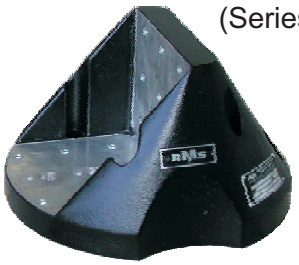
Slip table base with hydrostatic bearings

Options:

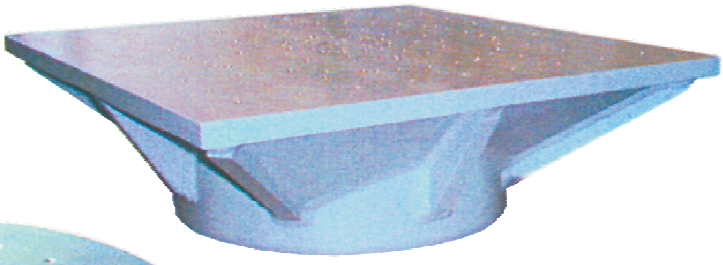
- **H**ydrostatic bearing design for enhanced guidance to support heavy payloads lead to a restrained movement, resulting in pure linear motion. (Type SWHxxx1)
- **R**egarding the application and the size and weight of the specimen, the hydrostatical guided slip table types can be optionally equipped with up to 7 bearings
- **V**arious slip table dimensions can be supplied for our different vibration systems.
- **G**rid design and thread dimensions can be selected.
- **S**uitable accessories are available for use in combination with a temperature/climatic chamber.
- **A** number of thermal barriers are available to protect the slip table against heat and cold from the connected temperature chamber.

Test fixtures and load-bearing platforms

T-Form / L-Form
(Series SWP 5000/6000)



Series SWP 1000 / 2000



Test fixtures,
square, rectangular,
round.

Series SWP 3000

Field of application:
Only a small number of test items can be fastened directly onto the mounting surface of the vibrator. Shape, size and test position of the test items require custom-built fixtures.

Characteristics:
We use test fixtures made of magnesium- and aluminium cast plates. These fixtures can be directly bolted to the moving element of the vibrator. The specimen can be mounted by means of the threaded inserts in the plate.

Options:
A special multipart transmitter shaft with a thermal barrier is available for combined use with a temperature chamber. Fixtures with additional bearings are also available for our systems with more than 5 kN.

For additional information please contact RMS sales department at vertrieb@rms-testsystems.de

RMS-vibration systems in temperature- /climatic chamber operation

Field of application:
International test specifications of automobile and aircraft industry demand combined stress of vibration and temperature/climate. The challenge is to combine the vibration system optimal with the temperature/ climatic chamber.

Characteristics:
Due to our multi-functional interface between chamber and vibrator we accomplish an optimal sealing of the temperature/climatic chamber and an effective temperature protection for the vibrator. Thus we ensure a perfect combination with all well-known temperature climatic chamber manufacturers.

Options:
In close collaboration between our design engineers and the specialists for climatic chambers we develop special solutions for the individual requirements of our customers.

Technical Data SW3-5445APP (50KN)

Shaker Specification

SW3-5445APP

Sine Force [KN] pk		50
Random Force [KN] rms (ISO5344)		50
Shock Force [KN] pk (half sine)		100
Usable Frequency Range [Hz]	5 ---	2700
Armature -Resonance [Hz]		2400
Acceleration [m/s²] pk)*1		1000,0
Velocity [m/s] pk (shock/sine))*	2,2 /	2
Displacement [mm] pk-pk (shock/sine)	51 /	51
Moving Mass [kg] (rated)		50
Load Support [kg] (max)		800
Armature Table Diameter [mm]		445
Insert Pattern Number		17
Insert Pattern Thread (metric)		12
Total Weight [kg])*3		4500
Dimensions (HWD) [mm]	1363 x 1760 x	1104
Total Power Consumption [KW]		75
Shaker noise [dBA] (max))*4		120

)*1: @ rated armature weight
)*2: @ bare table
)*3: @ standard trunnion
)*4 @ 1m distance
)*5: @ external raw water temp. 25°C
)*6: @ 1m distance, incl. silencer

Amplifier Specification

Type	Number of Cabinets
TGE10-5	2

Number of Power Moduls	5
Output Power [KVA]	50
Output Current [A] rms	500
Peak Current [A] pk	2000
Output Voltage [V] rms/peak	90 / 240
Efficience [%]	85-90
Switching Freq. [kHz]	110
Signal input [V] rms (for rated output voltage)	2
Signal-to-Noise [dB]	> 50
Bandwidth [Hz] (-3dB)	3000
Dim. (HWD) [mm]	1980x1220x820
Weight [kg]	800

Notes

Water Cooling Unit

Motor Power [KW]		3
Dimensions (HWD) [mm]	1980 x 810 x	610
Water Flow [l/min])*5	43 external	40 internal

Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH600	40	MG	51	600×600	300	1
SWH700	45	MG	69	700×700	400	2
SWH800	45	MG	83	800×800	500	2
SWH801	45	MG	93	800×800	4000	2
SWH900	45	MG	100	900×900	600	2
SWH1000	45	MG	120	1000×1000	700	2
SWH901	45	MG	120	900×900	4000	2
SWH1001	45	MG	130	1000×1000	4000	2

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables next page

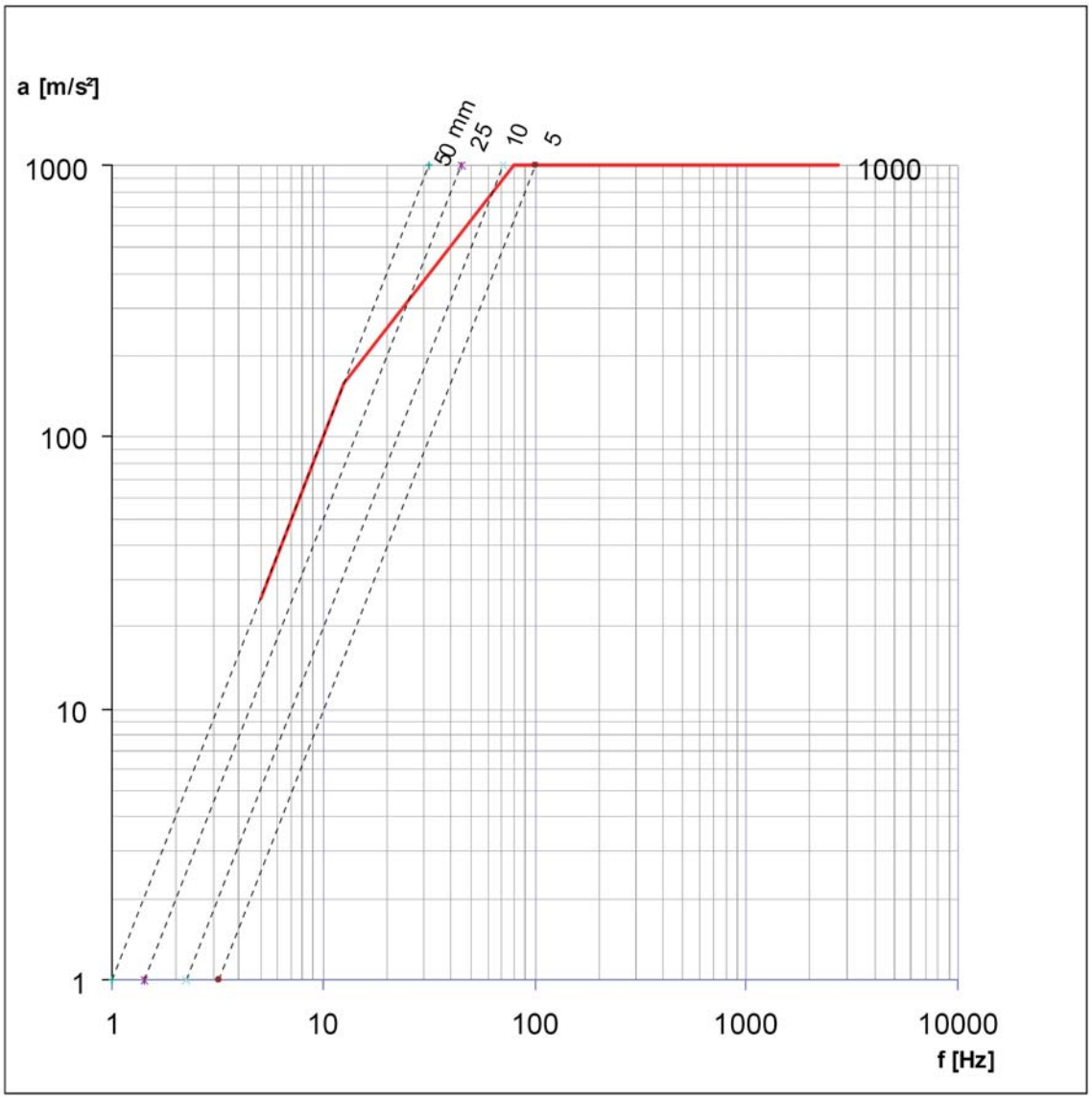
Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH1100	45	MG	140	1100×1100	800	2
SWH1101	45	MG	150	1100×1100	4500	2
SWH1200	45	MG	163	1200×1200	800	2
SWH1201	45	MG	172	1200×1200	4500-8000	2-4
SWH1301	50	MG	215	1300×1300	6500-13500	3-7
SWH1401	50	MG	245	1400×1400	7000-14000	3-7
SWH1501	50	MG	275	1500×1500	7000-14000	3-7

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables previous page

Sine Performance Curve : SW3-5445APP



Technical Data SW3-6445 (60KN)

Shaker Specification

SW3-6445APP

Sine Force [KN] pk			60
Random Force [KN] rms (ISO5344)			60
Shock Force [KN] pk (half sine)			120
Usable Frequency Range [Hz]	5	---	2700
Armature -Resonance [Hz]			2400
Acceleration [m/s²] pk)*1			1000,0
Velocity [m/s] pk (shock/sine))*	2	/	2
Displacement [mm] pk-pk (shock/sine)	51	/	51
Moving Mass [kg] (rated)			60
Load Support [kg] (max)			800
Armature Table Diameter [mm]			445
Insert Pattern Number			17
Insert Pattern Thread (metric)			12
Total Weight [kg])*3			4500
Dimensions (HWD) [mm]	1365	x 1760 x	1104
Total Power Consumption [KW]			75
Shaker noise [dBA] (max))*4			120

)*1: @ rated armature weight
)*2: @ bare table
)*3: @ standard trunnion
)*4 @ 1m distance
)*5: @ external raw water temp. 25°C
)*6: @ 1m distance, incl. silencer

Amplifier Specification

Type	Number of Cabinets
TGE10-6	2

Number of Power Moduls	6
Output Power [KVA]	60
Output Current [A] rms	590
Peak Current [A] pk	2360
Output Voltage [V] rms/peak	90 / 240
Efficience [%]	85-90
Switching Freq. [kHz]	110
Signal input [V] rms (for rated output voltage)	2
Signal-to-Noise [dB]	> 50
Bandwidth [Hz] (-3dB)	3000
Dim. (HWD) [mm]	1980x1220x820
Weight [kg]	800

Notes

Water Cooling Unit

Motor Power [KW]			3
Dimensions (HWD) [mm]	1980 x	810 x	610
Water Flow [l/min])*5	43 external		40 internal

Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH600	40	MG	51	600×600	300	1
SWH700	45	MG	69	700×700	400	2
SWH800	45	MG	83	800×800	500	2
SWH801	45	MG	93	800×800	4000	2
SWH900	45	MG	100	900×900	600	2
SWH1000	45	MG	120	1000×1000	700	2
SWH901	45	MG	120	900×900	4000	2
SWH1001	45	MG	130	1000×1000	4000	2

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables next page

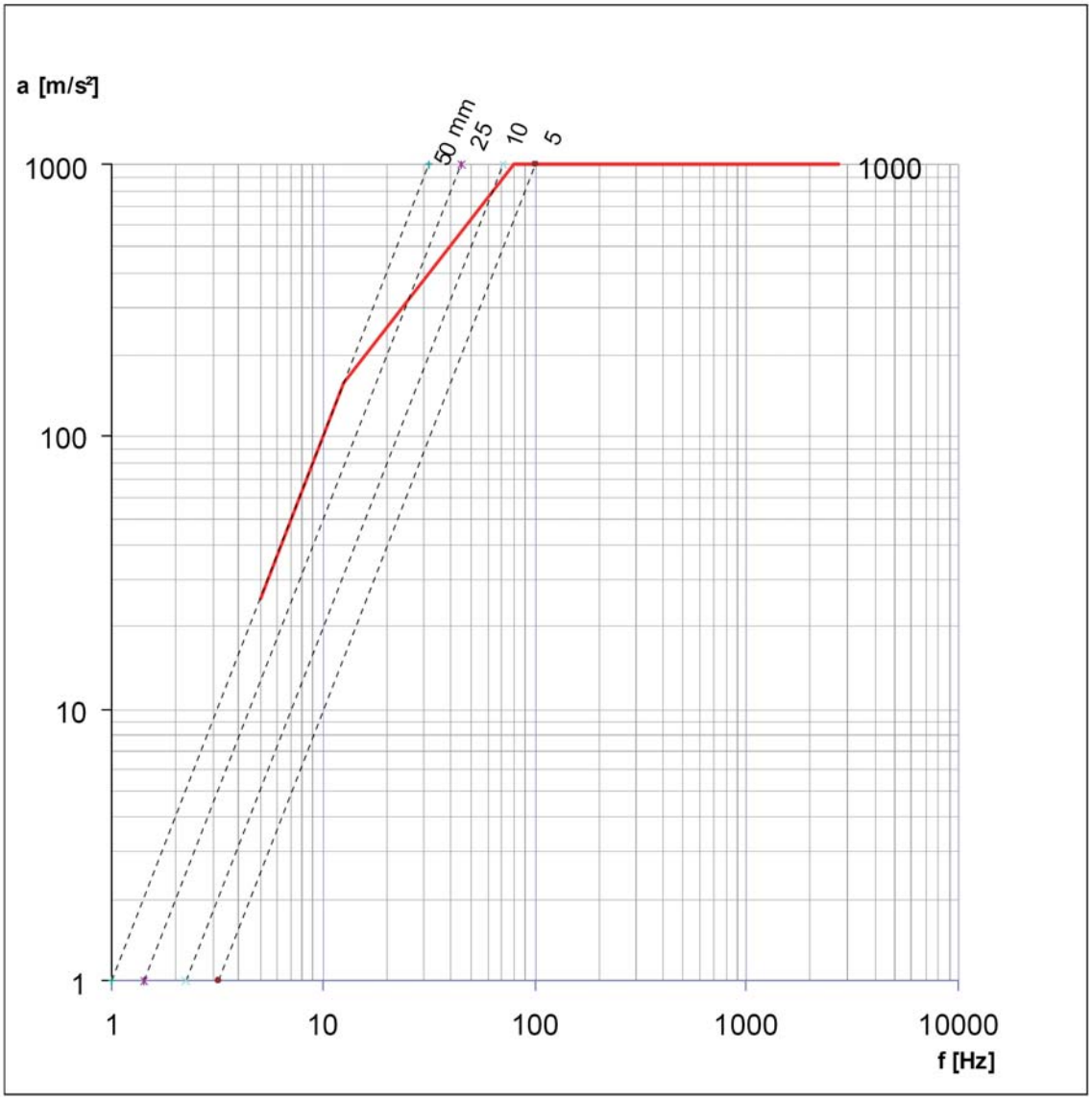
Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH1100	45	MG	140	1100×1100	800	2
SWH1101	45	MG	150	1100×1100	4500	2
SWH1200	45	MG	163	1200×1200	800	2
SWH1201	45	MG	172	1200×1200	4500-8000	2-4
SWH1301	50	MG	215	1300×1300	6500-13500	3-7
SWH1401	50	MG	245	1400×1400	7000-14000	3-7
SWH1501	50	MG	275	1500×1500	7000-14000	3-7

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables previous page

Sine Performance Curve : SW3-6445APP



Technical Data SW3-7445APP (70KN)

Shaker Specification

SW3-7445APP

Sine Force [KN] pk			70
Random Force [KN] rms (ISO5344)			70
Shock Force [KN] pk (half sine)			140
Usable Frequency Range [Hz]	5	---	2700
Armature -Resonance [Hz]			2400
Acceleration [m/s²] pk)*1			1000,0
Velocity [m/s] pk (shock/sine))*	1,8	/	2
Displacement [mm] pk-pk (shock/sine)	51	/	51
Moving Mass [kg] (rated)			70
Load Support [kg] (max)			800
Armature Table Diameter [mm]			445
Insert Pattern Number			17
Insert Pattern Thread (metric)			12
Total Weight [kg])*3			4500
Dimensions (HWD) [mm]	1365	x 1760 x	1104
Total Power Consumption [KW]			99
Shaker noise [dBA] (max))*4			120

)*1: @ rated armature weight
)*2: @ bare table
)*3: @ standard trunnion
)*4 @ 1m distance
)*5: @ external raw water temp. 25°C
)*6: @ 1m distance, incl. silencer

Amplifier Specification

Type	Number of Cabinets
TGE10-6	2

Number of Power Moduls	6
Output Power [KVA]	60
Output Current [A] rms	590
Peak Current [A] pk	2360
Output Voltage [V] rms/peak	90 / 240
Efficience [%]	85-90
Switching Freq. [kHz]	110
Signal input [V] rms (for rated output voltage)	2
Signal-to-Noise [dB]	> 50
Bandwidth [Hz] (-3dB)	3000
Dim. (HWD) [mm]	1980x1220x820
Weight [kg]	800

Notes

Water Cooling Unit

Motor Power [KW]					3
Dimensions (HWD) [mm]	1980	x	810	x	610
Water Flow [l/min])*5	58 external				40 internal

Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH600	40	MG	51	600×600	300	1
SWH700	45	MG	69	700×700	400	2
SWH800	45	MG	83	800×800	500	2
SWH801	45	MG	93	800×800	4000	2
SWH900	45	MG	100	900×900	600	2
SWH1000	45	MG	120	1000×1000	700	2
SWH901	45	MG	120	900×900	4000	2
SWH1001	45	MG	130	1000×1000	4000	2

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables next page

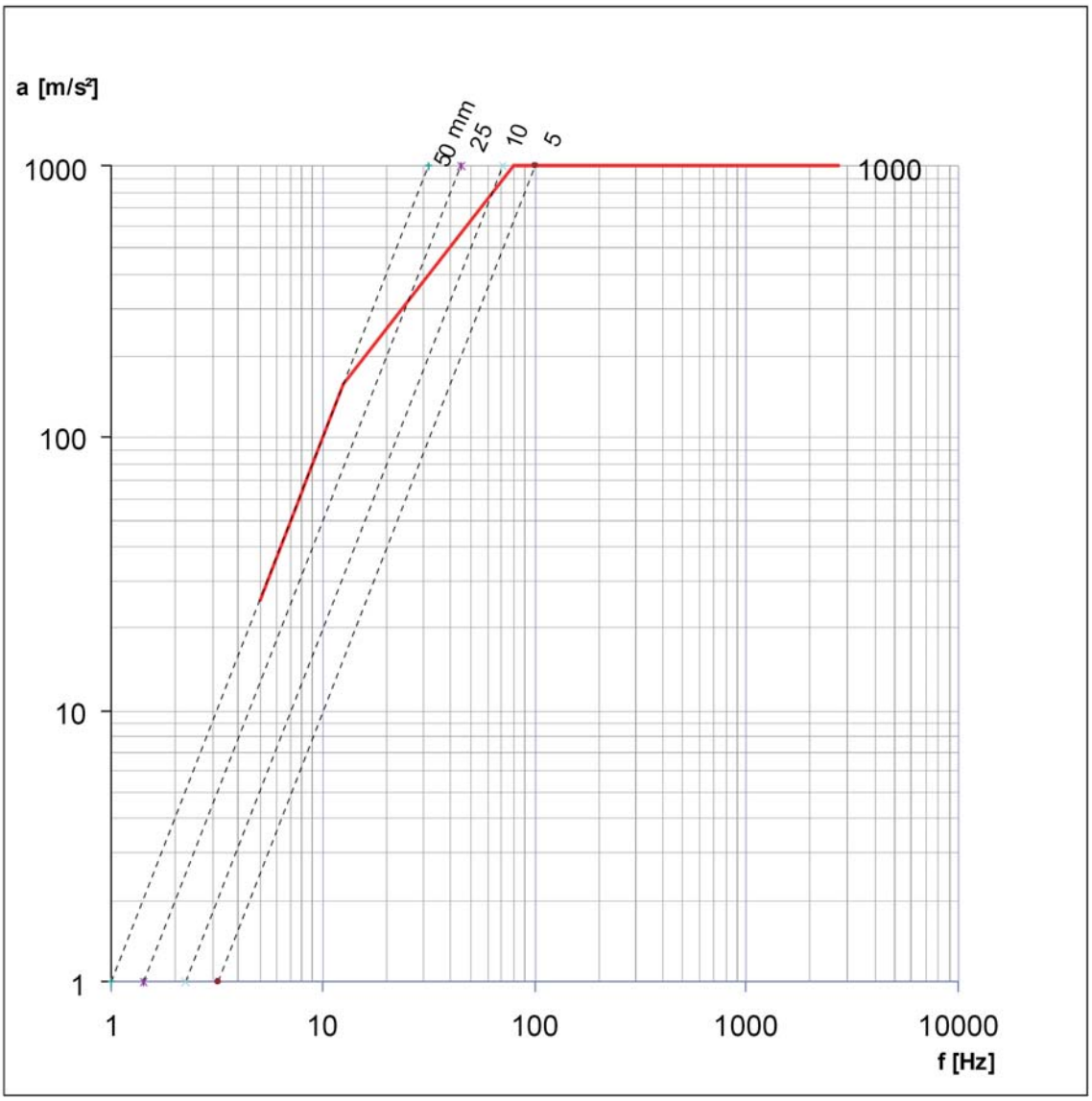
Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH1100	45	MG	140	1100×1100	800	2
SWH1101	45	MG	150	1100×1100	4500	2
SWH1200	45	MG	163	1200×1200	800	2
SWH1201	45	MG	172	1200×1200	4500-8000	2-4
SWH1301	50	MG	215	1300×1300	6500-13500	3-7
SWH1401	50	MG	245	1400×1400	7000-14000	3-7
SWH1501	50	MG	275	1500×1500	7000-14000	3-7

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables previous page

Sine Performance Curve : SW3-7445APP



Technical Data SW9110-80 (80KN)

Shaker Specification

SW9110-80

Sine Force [KN] pk		80
Random Force [KN] rms (ISO5344)		80
Shock Force [KN] pk (half sine)		160
Usable Frequency Range [Hz]	2 ---	3000
Armature -Resonance [Hz]		2000
Acceleration [m/s²] pk)*1		1600,0
Velocity [m/s] pk (shock/sine))*	3 /	2
Displacement [mm] pk-pk (shock/sine)	52 /	51
Moving Mass [kg] (rated)		50
Load Support [kg] (max)		500
Armature Table Diameter [mm]		435
Insert Pattern Number		19
Insert Pattern Thread (metric)		10
Total Weight [kg])*3		3700
Dimensions (HWD) [mm]	1150 x 1370 x	1055
Total Power Consumption [KW]		123
Shaker noise [dBA] (max))*4		120

Amplifier Specification

Type	Number of Cabinets
TGE10-12	3

Number of Power Moduls	12
Output Power [KVA]	120
Output Current [A] rms	1100
Peak Current [A] pk	4080
Output Voltage [V] rms/peak	90 / 240
Efficience [%]	85-90
Switching Freq. [kHz]	110
Signal input [V] rms (for rated output voltage)	2
Signal-to-Noise [dB]	> 50
Bandwidth [Hz] (-3dB)	3000
Dim. (HWD) [mm]	1980x1830x820
Weight [kg]	1550

Notes

Water Cooling Unit

Motor Power [KW]			3
Dimensions (HWD) [mm]	1980 x	810 x	610
Water Flow [l/min])*5		72 external	80 internal

Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH600	40	MG	51	600×600	300	1
SWH700	45	MG	69	700×700	400	2
SWH800	45	MG	83	800×800	500	2
SWH801	45	MG	93	800×800	4000	2
SWH900	45	MG	100	900×900	600	2
SWH1000	45	MG	120	1000×1000	700	2
SWH901	45	MG	120	900×900	4000	2
SWH1001	45	MG	130	1000×1000	4000	2

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables next page

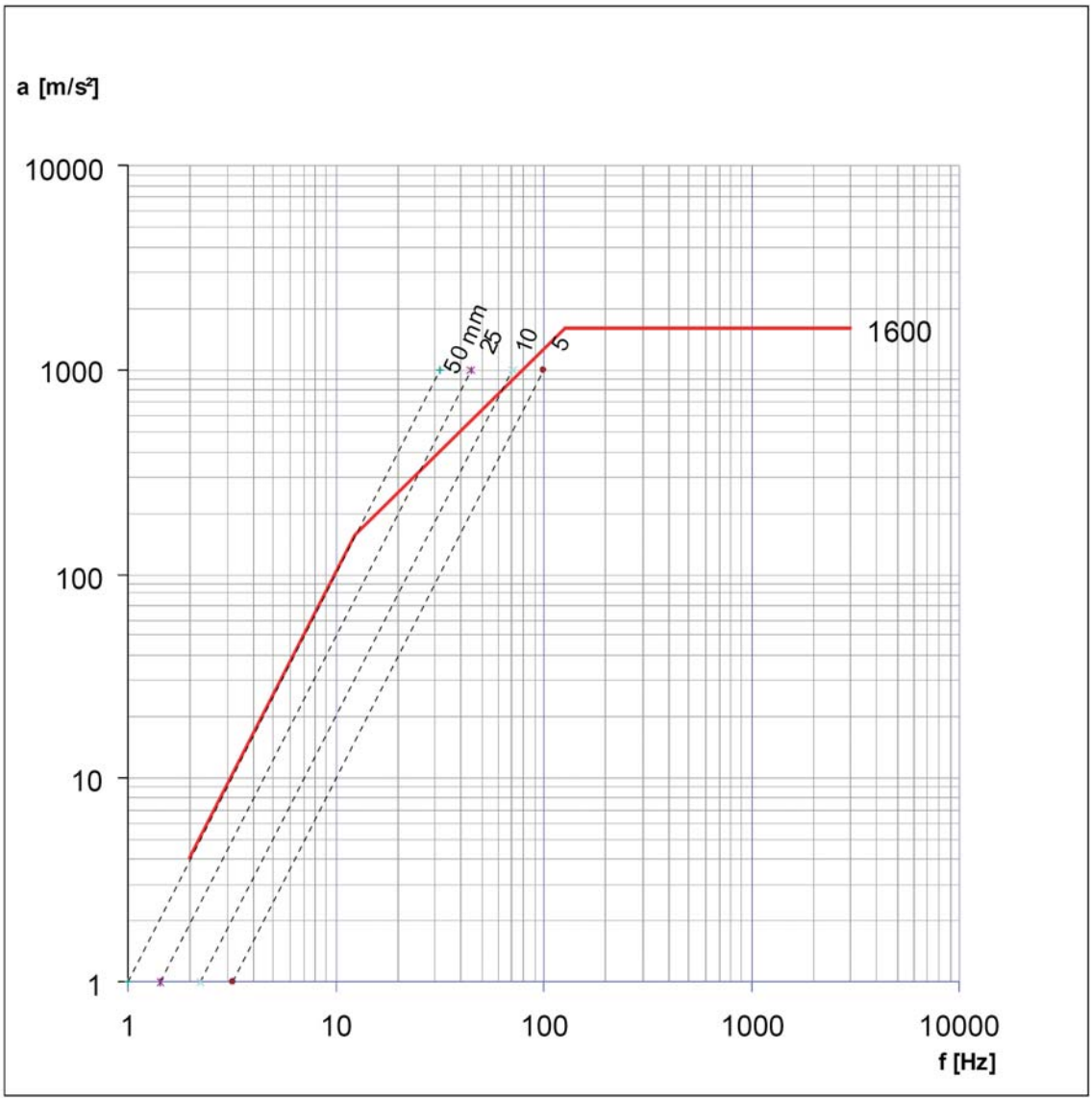
Usable slip tables

Type)*1	Thickness [mm]	Material	Mass [kg])*2	Size [mm]	Max. Load [kg])*3	No. of Bearings
SWH1100	45	MG	140	1100×1100	800	2
SWH1101	45	MG	150	1100×1100	4500	2
SWH1200	45	MG	163	1200×1200	800	2
SWH1201	45	MG	172	1200×1200	4500-8000	2-4
SWH1301	50	MG	215	1300×1300	6500-13500	3-7
SWH1401	50	MG	245	1400×1400	7000-14000	3-7
SWH1501	50	MG	275	1500×1500	7000-14000	3-7

)*1 slip table types ending with: 1 = hydrostatic bearings, 0 = V-groove bearings)*2 incl. joint
)*3 depending on the location of the payload on the table

More usable slip tables previous page

Sine Performance Curve : SW9110-80



Space for your notes

THE WORLD OF RMS TEST SYSTEMS

Test systems for vibration testing of components and units

- Electrodynamic Vibrator Systems for Sine, Random, Shock, Resonance and Multitesting
- Benches for environmental stress screening
- Pneumatic shock test machines (AVEX/USA)
- Servo hydraulic Vibrators / Slip Tables

Test Benches & Motion Simulators

- Single/Multi Axis Rate/Position Systems
- Direct Drive Centrifuges for generation of accelerations
- Customized Simulators / Hardware-in-the-Loop Testing
- Long-stroke vibration system for surveying Dynamic acceleration sensors
- Cornering Fatigue and Torsional Vibration Test Stands

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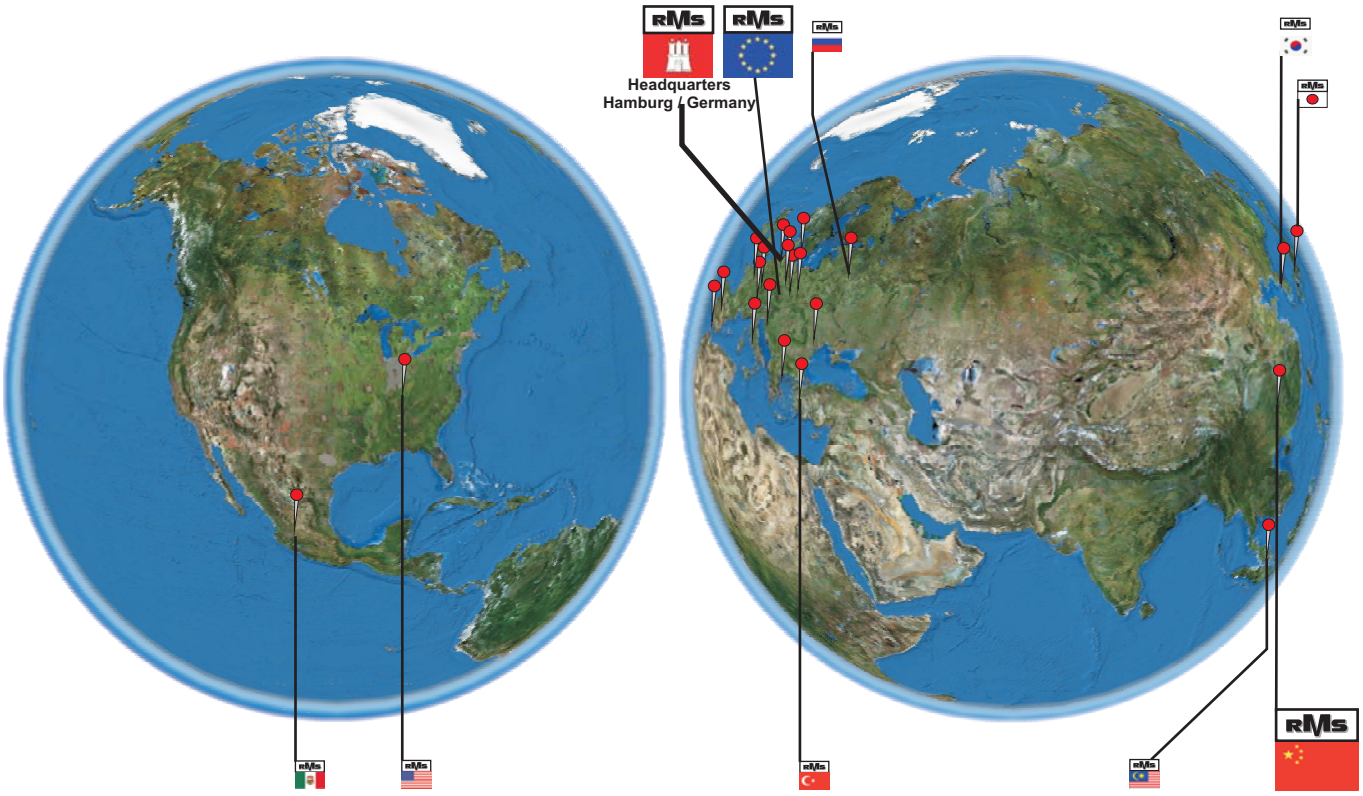
Engine and Airframe Test Equipment

- Engine Tracking/Trim Equipment (Line Maintenance)
- Test & Simulation of APU, PMC, N1/N2, RPM
- Electronic Tester for Overhaul and Workshop
- Check/Test & Adjustment of the angular deflection of aircraft flight control surfaces

RMS Dynamic Test Systems

RMS worldwide distribution network



2008

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